

United States  
Department of  
Agriculture

Forest Service

Pacific  
Northwest  
Region



# **Rogue River - Siskiyou National Forest**



## **Land and Resource Management Plan**

# **MONITORING AND EVALUATION REPORT**

***Fiscal Year 2004***

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***Report on 2004 and 2005  
Inventory and Monitoring  
Projects***

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# ROGUE RIVER-SISKIYOU NATIONAL FOREST LAND AND RESOURCE MANAGEMENT PLAN

## MONITORING AND EVALUATION REPORT For Fiscal Year 2004

### Report on 2004 and 2005 Inventory and Monitoring Projects

## INTRODUCTION

### Background

The Rogue River National Forest Land and Resource Management Plan (LRMP or Forest Plan) became effective in July of 1990. The Forest Plan for the Siskiyou National Forest became effective in March of 1989.

These Forest Plans provide direction for integrated management of the resources of each National Forest. The Forest Plans are implemented through projects designed to be consistent with its direction and land allocations. Monitoring is an integral part of the Forest Plan. Projects and programs are monitored for consistency with the plan and to test the validity of the plan itself. There is provision for amendment of the Forest Plan where monitoring shows a need for change or when changes in laws and regulations occur.

On April 13, 1994, the Record of Decision for *Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* was signed by the Secretary of Agriculture, Mike Espy and the Secretary of the Interior, Bruce Babbitt. This Record of Decision (ROD) amended the Rogue River and Siskiyou National Forest Land and Resource Management Plans and provided new direction for management of the natural resources of the Forests.

This ecosystem plan, also known as the Northwest Forest Plan, is significant because it provided a watershed-based approach to management of Federal lands within the range of the northern spotted owl. The future management of late-successional and old-growth forests, recovery of the northern spotted owl and an Aquatic Conservation Strategy to restore aquatic ecosystems are central parts of this Plan. Whenever the term "Forest Plan" is mentioned in this document, it refers to the Rogue River and/or Siskiyou National Forest Land and Resource Management Plans as amended by the April 13, 1994, Record of Decision.

Fiscal year 2004 also marked the tenth year of the implementation of the Northwest Forest Plan (NWFP). Monitoring implementation of standards and guidelines from the Northwest Forest Plan has been ongoing and reports are available on the Regional Ecosystem web site: [http://www.reo.gov/monitoring/report\\_show.php](http://www.reo.gov/monitoring/report_show.php). Monitoring data and research reports relating the knowledge gained in the first ten years of the NWFP were published this year. More information is available at <http://outreach.cof.orst.edu/nwforestplan>.

In December 2003, the Forest Service Washington Office approved administrative consolidation of the Rogue River and Siskiyou National Forests. Reference is made throughout this Monitoring Report to the Rogue River-Siskiyou National Forest (RR-SNF) as applicable. When reference is made to the 1990 Forest Plan or land management direction applicable to the Rogue River National Forest, the phrase Rogue River National Forest (RRNF) continues to be utilized. When reference is made to the 1989 Forest Plan or land management direction applicable to the Siskiyou National Forest, the phrase Siskiyou National Forest (SNF) continues to be utilized.

The Rogue River-Siskiyou National Forest now works under a consolidation of the two respective Forests. This includes operation under a single Forest Supervisor, a Deputy Forest Supervisor, and a single set of Staff Officers for overall management of both National Forests. In concert with this organizational mode, this Monitoring and Evaluation Report has been organized and is reported under a consolidated Forest assumption.

Throughout this report, reference is made to certain organizational units of the Forest as Districts or Zones. Reference is made to the Powers Ranger District, the Pacific Zone (Chetco and Gold Beach Ranger Districts), the Two Rivers Zone (Cave Junction and Galice Ranger Districts), the Cascade Zone (Prospect and Butte Falls Ranger Districts), and the Siskiyou Zone (Applegate and Ashland Ranger Districts).

Monitoring reports track implementation of the Forest Plans. **This report documents selected monitoring efforts and evaluation of Forest Plan implementation during fiscal year (FY) 2004 (10/1/03 to 9/30/04).** This report generally covers Forest Plan monitoring elements and is a summary of selected Forest reports and monitoring efforts. It is not a report of all of the programs or program accomplishments on the Forest.

Forest Plan monitoring is an ongoing process. The Rogue River-Siskiyou National Forest is continuously monitoring and evaluating new information and changing conditions. Monitoring activities and results have been summarized in annual monitoring reports for several years; this report is the latest of several Forest Plan Monitoring and Evaluation Reports previously prepared for each National Forest. These documents are available to the public upon request.

## **Forest Plan Monitoring Strategies**

The Monitoring Strategy for the **Rogue River National Forest (RRNF)** became effective in 1990 with the signing of the Forest Plan. Chapter 5 of the RRNF Forest Plan contained a summary of the Monitoring and Evaluation of Forest Plan implementation. That strategy was based on that summary and on the detailed monitoring worksheets contained in the Planning Record. Beginning in May 1995, the Rogue River National Forest began working on an update to the previous strategy. An update was needed to bring the Forest Plan closer to the current situation of forest management under the Northwest Forest Plan and the monitoring goals of this plan and the goals of the Ecosystem Monitoring Framework<sup>1</sup>. Since these monitoring processes are still in their developmental and baseline information gathering stage, an update to the Forest Plan monitoring strategy was needed to “fill in the Gap” between the old plan and the new plans under development.

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<sup>1</sup> The Ecosystem Monitoring Framework is a concept originating on the RRNF in 1993. It was documented in an Ecosystem Monitoring Handbook, Version 1.3. This handbook contains methodology for gathering predetermined baseline information and develops indicators of change within multiple ecosystems, found within the influence of the RRNF. Three components of the ecosystem (Physical/Chemical, Biological and Human Dimension) are described in this Handbook; this organization is complementary to current ecosystem principles, monitoring under the Northwest Forest Plan, and with the Monitoring Strategy Update.

*The Rogue River National Forest Monitoring Strategy Update* is a distillation and improvement of the key components of the 1990 Strategy. The Strategy defines the items to be monitored and contains the Forest goals, outputs and desired future conditions, key monitoring questions, units of measure, frequency, proposed monitoring methods, standards, and assigned responsibilities. The Monitoring Strategy Update was completed in January 1997, and is available as a separate document from the Forest Supervisor's Office. Monitoring and Evaluation Reports for the Rogue River National Forest have been based on this Monitoring Strategy Update since 1997.

The Monitoring Strategy for the **Siskiyou National Forest (SNF)** first became effective in 1989 with the signing of the Forest Plan. Chapter 5 of the SNF Forest Plan contains a summary and table for the components of the Monitoring and Evaluation program. The Monitoring and Evaluation Program for the SNF has been guided by that document since 1989 and several annual reports have been prepared and are available upon request.

## **Monitoring Strategy for 2004**

Federally appropriated funding for monitoring and monitoring reports has been minimal over the previous few years. In fiscal year 2004 (as was the case in fiscal years 2001 through 2003), some additional funding specifically earmarked for monitoring and reporting was available. As in the 2003 Report, reporting is done on specific elements of the respective monitoring strategies, rather than prepare a complete report on all elements. The goal of this approach was to provide meaningful data or results on elements actually monitored, rather than to generate incomplete information on all elements. In addition, several specific inventory and monitoring projects were conducted in 2004 and 2005 with additional funding. This report includes summaries of those projects. This 2004 report includes discussion on the following:

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### **Monitoring and Evaluation**

Monitoring and evaluation in the Pacific Northwest Region (Region 6) is reactive to the major transformation molding the agency nationally and inherent to society as a whole. The scope and importance of activities on or near the National Forests have become significant to “everybody”. In this context, monitoring exists to serve management. For that reason, the Rogue River-Siskiyou National Forests and Region 6 strives to put monitoring and evaluation in the context of “adaptive management”.

For the purpose of this report, Forest Plan monitoring is done to measure progress in Forest Plan implementation. It consists of gathering data, making observations, and collecting and disclosing information. Monitoring is also the means to determine how well objectives of the Forest Plan are being met, and how appropriate the management Standards and Guidelines are for meeting the Forest’s outputs and providing environmental protection. Monitoring is used to determine how well assumptions used in the development of the Forest Plan reflect actual conditions.

Monitoring and evaluation may lead to changes in practices or, provide a basis for adjustments, amendments, or Plan revisions. Monitoring is intended to keep the Forest Plan dynamic and responsive to change. Upon evaluation of the data and information, determinations are made as to whether or not planned conditions or results are being attained and when they are within Forest Plan direction. When a situation is identified as being outside the limits of acceptable variability, changes may need to occur.

While monitoring and evaluation comprises the control system over management activities on the Forest, each has a distinctly different purpose. Monitoring is gathering information and observing management activities. Forest Plan **monitoring** on the Rogue River-Siskiyou National Forest has been organized into four levels:

**Implementation Monitoring** is used to determine if the objectives, standards, guidelines, and management practices specified in the Forest Plan are being implemented. In other words, “Did we do what we said we were going to do?”

**Effectiveness Monitoring** is used to determine if the design and execution of the prescribed management practices are effective in meeting the goals, objectives, and desired future condition stated in the Forest Plan. Simply stated, “Are the management practices producing the desired results?”

**Baseline Monitoring** is designed to characterize the existing or previously existing condition for comparison with future monitoring or predicted conditions. In some cases this can refer to an initial inventory or set of measurements taken at the beginning of monitoring efforts. This type of monitoring is useful as a starting point or comparison for the other types of monitoring and can form a basis for trend detection.

**Validation Monitoring** is used to determine whether data, assumptions, and coefficients used to predict outcomes and effects in the development of the Forest Plan are correct. Again, stated another way, “Are the planning assumptions valid, or are there better ways to meet Forest Plan goals and objectives?”

**Evaluation** is the analysis and interpretation of the information provided by monitoring. Evaluation is the feedback mechanism identifying whether there is a need to change how the Forest Plan is being implemented to comply with existing direction, or whether a need to change Forest Plan direction itself through amendment or revision exists.

Typically, several years of effectiveness and validation monitoring results are needed to permit meaningful evaluation of trends against baseline data. For this reason, this report contains few results on the effectiveness of the Standards and Guidelines or the validity of Forest Plan models and assumptions. It emphasizes the question, “Did we do what we said we were going to do?” as well as reporting progress that is being made on answering questions of effectiveness and validation.

## MONITORING RESULTS

### **Part One: Selected Forest Plan Items for the FY 2004 Report**

This section presents the results and evaluation of the selected Forest Plan Monitoring Items that were monitored during FY 2004, for the Rogue River and Siskiyou National Forests. Each Monitoring Item is briefly described by the monitoring Category, Group and the individual Goals and Objectives that comprise the Monitoring Item. Also brought forward are selected Monitoring Questions from the Monitoring Worksheets, based on the respective monitoring strategies. Based on these questions, results and evaluations are presented, including recommendations. Note that monitoring items are sometimes reported in this document separately for each National Forest, yet together according to the selected element. Recommendations are applicable to both National Forests, unless otherwise noted.

## *Physical Resources*

### **MONITORING ITEM: *AIR QUALITY***

**GOAL(S), MONITORING QUESTION(S):** The goal for the Rogue River National Forest is to reduce Total Suspended Particulates (TSP) produced by prescribed fire to 56% of the base year production level. This goal is to be reached within ten years from the base year, which is 1991. Total TSP for 1991 was 39,708 tons. The goal for the Siskiyou National Forest is 7,300 tons or less produced on an annual basis. The monitoring questions include:

- **Is Best Available Technology (BAT) as defined by the Oregon State Implementation Plan (SIP), being utilized?**
- **Are management activities meeting the requirements of the Oregon SIP?**
- **Are tons of yearly TSP production on a downward trend toward the 2001 goal?**
- **Siskiyou NF: Does Total Suspended Particulate produced from planned ignitions exceed 7,300 tons Forest-wide annually?**

### **FINDINGS and EVALUATION**

#### ***Rogue River National Forest***

Results of monitoring show that Best Available Technology is being used. Review of project plans show a trend in the use of treatment methods other than prescribed fire. Management activities were in compliance with the Oregon State Implementation Plan (SIP).

For fiscal year 2004, 1,253 acres were burned with prescribed fire and approximately 3,712 tons of fuel was consumed. This equates to **92.8 tons of Total Suspended Particulate (TSP)** produced. This is equal to 1.6 % of the base year production of 40,000 tons. The trend is clearly downward and has reached the 2001 maximum production goal of 22,236 tons. With the planned increase in hazardous fuels reduction projects in the near future, TSP production may increase, but it should still remain well below the 22,236 ton goal (56% of the 1991 base year TSP). This portion of the Forest met all Smoke Management Guidelines and experienced no intrusions. Based on these findings, monitoring indicates that management direction is being achieved.

#### ***Siskiyou National Forest***

In fiscal year 2004 there were 356 acres burned with prescribed fire and approximately 4,142 tons of fuel consumed. This equates to **103.55 tons of total suspended particulates (TSP)** emitted from these burns. This is far below the threshold (.06%) of 7,300 tons. With the planned increase in hazardous fuels reduction projects in the near future, TSP amounts may increase, but should still stay well below the 7,300 ton threshold of concern. This portion of the Forest met all Smoke Management Guidelines and experienced no intrusions. Based on these findings, monitoring indicates that management direction is being achieved.

**RECOMMENDATIONS:** Based on these findings, monitoring indicates that management direction is being achieved on the Forest.

## **MONITORING ITEM: *WATER QUALITY***

**GOAL(S), MONITORING QUESTION(S):** The goal is to maintain or enhance water quality in all Forest streams to maintain beneficial uses as directed by the Clean Water Act. Water quality is to be restored to the level of the standards, where current quality does not meet standards. The monitoring questions are:

- Does water quality meet the State Water Quality Standards?
- Are the Best Management Practices (BMPs) related to water resources being implemented in management activities?
- Are the BMPs effective in maintaining water quality at desired levels?
- Are management activities allowing stream channel forming processes to operate naturally, meeting the potential for fisheries habitat?

### **FINDINGS AND EVALUATION**

#### ***Stream Temperatures - Rogue River and Siskiyou National Forest***

In 2004, stream temperatures were measured at 68 sites at 30-to-60-minute intervals from June through September. The results (see table below) were compared to the Oregon water quality standard for stream temperature. The Oregon water quality standard is to have the seven-day moving mean of the daily high temperature at or less than 64°F.

**Table 1. Results from 2004 Stream Temperature Monitoring**

<b>Stream</b>	<b>Maximum 7-day Average High Temperature, °F</b>		<b>Stream</b>	<b>Maximum 7-day Average Temperature, °F</b>
<b>Cascade Zone</b>				
Abbott Creek	73.6		Big Ben Creek	51.2
Bitter Lick Creek @ NF Boundary	64.5		Bitter Lick Creek – Isolated	71.2
Woodruff Creek	74.9		East Fork Muir Creek	49.5
Flat Creek	71.7		Foster Creek	70.2
Ginkgo Creek	54.6		Hawk Creek below Boise	77.3
Muir Creek	58.0		National Creek	54.1
Red Blanket Creek	56.3		South Fork Rogue River	55.7
Sugarpine Creek	67.2		Union Creek	53.4
Bitter Lick Upper Boise	70.3		West Branch Willow Creek	75.1
<b>Siskiyou Zone</b>				
East Fork Ashland Creek @ 2060 road	56.2		East Fork Ashland Creek above Reeder Reservoir	68.4
West Fork Ashland Creek @ 2060 road	54.8		West Fork Ashland Creek above Reeder Reservoir	62.0
Yale Creek	59.9		North Fork Little Butte Creek	65.6
South Fork Little Butte Creek below Latgawa	68.4		Ashland Creek below Reeder Reservoir	68.4
Dead Indian Creek	67.5		Lower Beaver Creek	69.0



Stream	Maximum 7-day Average High Temperature, °F		Stream	Maximum 7-day Average Temperature, °F
<b>Pacific Zone</b>				
Chetco River above Madstone	72.0		Little Chetco River below Henry	76.7
South Fork Lawson Creek @ Mouth	65.5		Lawson Creek @ Trail	73.9
Lawson Creek @ Mouth	73.9		Indigo Creek	74.0
Silver Creek	73.2		Foster Creek	71.6
Shasta Costa Creek	72.8		Bradford Creek	62.8
Quosatana Creek	74.3		Lobster Creek	70.3
South Fork Lobster	40.3		North Fork Lobster	66.0

<b>Two Rivers Zone</b>				
Slate Creek @ NF Boundary	66.4		Waters Creek @ NF Boundary	66.2
West Fork Waters Creek	64.5		Secret Creek	64.0
Briggs Creek above Secret Creek	67.2		Soldier Creek above Spalding Pond	52.5
Horse Creek	63.7		Taylor Creek @ English Meadows	70.0
Soldier Creek below Spalding Pond	65.0		Dunn Creek above North Fork Dunn Creek	66.9
Minnow Creek	63.4		Elder Creek @ NF Boundary	61.0
Sucker Creek above Bolan Creek	62.3		Limpy Creek @ NF boundary	65.2
Sucker Creek below Grayback Creek	68.6		S. Fk. Galice Creek @ mouth	69.5
East Fork Illinois River above Dunn Creek	69.2		Shade Creek	66.1
Page Creek @ NF Boundary	63.5		Josephine Creek @ Mouth	79.7
Shan Creek @ Mouth	72.0		West Fork Illinois River @ mouth	79.5
Little Sixmile Creek	69.3		Deer Creek @ mouth	80.8
Spring Creek	66.6		Rough & Ready Creek @ NFS boundary	82.3

As in previous years, there are many streams that exceed the Oregon Water Quality standard for summer temperature. The exact number of streams that exceed the standard changes from year-to-year, depending mainly on runoff volume and timing.

**RECOMMENDATIONS:** Stream temperature monitoring should continue. The monitoring should be done on a cooperative basis with other interested parties such as local watershed councils, ODEQ, ODFW, and other federal agencies. This information, along with fish habitat surveys and other water quality investigations can form the basis for building restoration strategies that cross ownership lines and can document the recovery of riparian areas over time.

### **Effectiveness of Best Management Practices**

There was no formal review of BMPs on projects in 2004.

## ***Biological Resources***

### **MONITORING ITEM: *VEGETATION MANAGEMENT EFFECTIVENESS***

**GOAL(S), MONITORING QUESTION(S):** The forest goal is to be in compliance with the Forest Plans and with the Regional Guide, which specifies compliance with the *Managing Competing and Unwanted Vegetation Final Environmental Impact Statement* and *Mediated Agreement*. Overall goals include utilization of management practices that best suit the land management objectives. The monitoring questions include:

1. **How are the number of trees planted per acre and their survival and growth being affected by the amount of site preparation being done on the Forest?**
2. **Are young conifers being released from competing vegetation in a timely and cost-effective manner?**
3. **Are long-term growth and yield projections being affected by the use (or non-use) of herbicides and prescribed burning?**
4. **Is the Forest meeting the intent of the Managing Competing and Unwanted Vegetation Final Environmental Impact Statement and Mediated Agreement?**
5. **Are Best Management Practices (BMPs) being effectively implemented for noxious weeds, Port Orford cedar disease (POC) and sudden oak death (SOD)?**

#### **FINDINGS AND EVALUATION:**

1. In fiscal year 2004, the Forest planted 7,327 acres, 6,159 acres of which were in the Biscuit Fire area. First year survival was 82%, which is an improvement over last year's report of 55% survival. The following factors contributed to the improvement over the previous year: (1) freezer storage of all seedlings and most stock had only minimum storage following thawing, (2) good weather conditions during planting, and (3) an excellent quality planting job (greater than 90% on Forest Service verification inspection). The effect of freezer storage may have been significant. A recent comparison showed an approximate 10% improvement in survival of freezer-stored stock in comparison to conventional cold storage.

The Rogue River-Siskiyou National Forest continues to prioritize an aggressive animal damage control program to improve reforestation success.

Third year seedling survival monitoring results indicate that 341 acres were satisfactorily stocked; this accounts for 91% of the total acres reforested. First time success (meeting prescribed stocking objectives with one treatment) is 212 acres, this accounts for 98% of the total acres certified in fiscal year 2004.

Two introduced pathogens that cause tree mortality are present on the Rogue River-Siskiyou National Forest. White pine blister rust infects the five needle white pine species, and Port-Orford-cedar (POC) root disease. These pathogens are particularly devastating to young sugar pine and western white pine and POC regeneration.

The Forest continues to plant white pine blister rust-resistant tree seedlings in its reforestation program to maintain white pines in the ecosystem. The Forest is also planting POC root disease resistant tree seedlings to maintain POC in its ecosystems.

2. Forest reforestation specialists are mostly successful implementing release treatments in a timely and cost-effective manner. Applying paper or plastic mulch material around crop trees is often used to release tree seedlings from herbaceous vegetation competition. This release treatment is cost effective in most cases, as mulch is usually applied at the same time as tree planting. However, release from woody vegetation is more expensive and usually requires manual control methods with chain saws to remove competing vegetation. In these situations, a more cost effective release method would involve herbicide use. Three zones, Two Rivers, Cascade, and Powers, accomplished manual release treatments in fiscal year 2004 totaling 1,641 acres.

From the fiscal year 2004 Needs Report, 3,733 acres received pre-commercial thinning treatments during 2004, out of 19,570 acres identified as a need at the end of fiscal year 2003. This represents 19% of the pre-commercial thinning need treated.

From the fiscal year 2004 Needs Report, 1,641 acres received release treatments during 2004, out of 6,459 acres identified as a need at the end of fiscal year 2003, for the Forest. This represents 25% of the release need treated.

Low treatment percentages are due to lack of funding. Not accomplishing planned release and pre-commercial thinning treatments *will* have an adverse effect upon meeting timber outputs projected in the Land and Resource Management Plan.

In fiscal year 2004, reforestation monitoring reports indicated prescribed treatments are cost-effective, based on minimal monitoring of other resource activities (weed control, range, fuels, wildlife, etc.). All harvest units were monitored for stocking levels and certified as meeting Forest stocking standards where appropriate.

3. No recent growth simulations have been made comparing long-term growth and yield of herbicide treated stands with non-treated stands. However, yield tables prepared for the Forest Plans show an approximate 5 to 10% reduction in cubic volume mean annual increment and a 10-year delay in culmination of mean annual increment for non-treated stands.

4. Pacific Northwest (PNW) Regional policy for managing competing and unwanted vegetation is contained in the FEIS (1988). The Record of Decision (ROD) for this FEIS includes all forest vegetation management programs except for thinning and harvest of commercial tree species. When the ROD was signed, Department of Justice filed a motion in the District Court to lift the injunction on herbicide use in the PNW Region. The Court ordered the parties into mediation, resulting in the Stipulated Order and Mediated Agreement. The key provisions of Regional Policy are:

- The ROD identifies "Prevention" as the preferred strategy for managing competing and unwanted vegetation.
- Any proposal to treat competing and unwanted vegetation must consider three pages of specific analysis items from the Mediated Agreement (environmental effects, human health risks, and post treatment vegetation response).

- Herbicides shall only be used when other methods would not be effective at meeting management goals or would be unreasonably costly. The Rogue River-Siskiyou National Forest has not used herbicides since the ROD, except for noxious weed control.
- In recent years, (1998 through 2001), 2,150 acres were treated with herbicides for reforestation in the PNW Region; about 50,000 acres were treated with non-chemical methods. No silvicultural release treatments in the Region have used herbicides under the 1988 ROD.
- 2,4-D herbicide is further restricted; it can only be used as a “last resort” when no other available herbicide or non-chemical method meets the above efficacy and cost criteria. No forest has used 2,4-D under the 1988 ROD for anything.
- Thirteen herbicides are available from the ROD; each must have a “Herbicide Information Profile” prepared for communication to workers and to the public. Three herbicides appropriate for site preparation and release have Profiles.
- There is no expiration of the provisions and terms of the Mediated Agreement. As long as the 1988 ROD remains Regional direction, the Mediated Agreement remains in effect.
- If a signatory believes that the Forest Service is not complying with provisions of the Mediated Agreement, they may request court review and enforcement.

5. In November 1998, the *Rogue River NF Noxious Weed Strategy* emphasized **Prevention** and identified appropriate treatment methods. In May 1999, an Environmental Assessment and Decision Notice for *Integrated Noxious Weed Management on the Rogue River National Forest* further refined appropriate methods based on species and size of infestation for known noxious weed sites.

Best Management Practices (BMPs) further provides prevention direction. The Rogue River-Siskiyou National Forest is currently implementing *Best Management Practices for Noxious Weed Prevention and Management, Port-Orford-Cedar Root Disease Prevention and Management, Sudden Oak Death Prevention and Management* (February 2002). The objectives of this interim direction are to 1) reduce the risk of spreading noxious weeds; 2) prevent the establishment of new invaders; 3) integrate weed management practices into resource programs; 4) conduct research and monitoring to evaluate effectiveness and identify emerging issues; 5) reduce spread and integrate management practices for POC and SOD; and 6) build awareness within the agency.

### **Port-Orford-Cedar Root Disease (POC)**

BMPs for POC are currently being implemented during the Biscuit Fire restoration projects, and other Forest projects within or adjacent to POC disease centers.

On March 29, 2004, a Record of Decision was signed by the Forest Supervisor to adopt new direction for managing Port-Orford-Cedar root disease (POC). This ROD takes a more aggressive approach into managing POC during planning of transportation, off-road vehicle use and special forest products activities and other forest uses. Following are a summary of key points of this decision; the ROD amends the 1989 Siskiyou NF Forest Plan by:

- Better describing available treatments.
- Provides a risk key to help managers consistently determine which special protection measures need to be applied.
- Provides special emphasis on protecting 144 two thousand acre watersheds that do not currently have the disease.
- The ROD will not change any NW Forest Plan land use allocations or affect private land.
- Port Orford cedar may be removed 25-50 feet of some roads to reduce potential for new infection of healthy Port-Orford-cedar populations or to remove diseased trees.
- Complex timber sales and fuels treatments may require specific equipment types, seasonal operations, and washing of equipment.
- Fire fighting activities will include treating potentially infested water with Clorox bleach, but only when the requirements do not delay protection of life and private property.

### **Sudden Oak Death (SOD)**

SOD was first discovered in Oregon in July 2001. Since then, efforts have been underway to eradicate the pathogen by cutting and burning all infected host plants and adjacent uninfected plants. Each year, two fixed-wing aerial surveys search for recently killed tanoaks (*Lithocarpus densiflora*) in SW Oregon. All dead host trees identified by air are visited on the ground to determine cause of death and to attempt isolating SOD infection centers. Ground-based surveys also looked for early indicators of SOD infection on rhododendron (*Rhododendron macrophyllum*), Oregon myrtle (*Umbellularia californica*), and evergreen huckleberry (*Vaccinium ovatum*) in the vicinity of all known SOD infestations.

- Number of infected trees has decreased each year.
- Most infected trees discovered were within 200 meters of eradication sites. ,
- Each year, new sites occur close to or in a northerly direction from other sites, following prevailing rainy season wind, and suggesting aerial or vector-mediated spread.

Despite several new occurrences of SOD in 2004, distribution of the pathogen in forests remains limited to a very small area near Brookings, Oregon. Interim BMPs for SOD are currently being implemented for activities in proximity to areas infected with SOD.

**CONCLUSIONS AND NEEDS:** Based on these findings, there is no immediate action needed for vegetation management effects on timber harvest treatments. It is recommended that further action be taken to develop monitoring practices that will verify if other resource activities (weed control, range, fuels, wildlife, etc.) are being planned and designed in compliance with this agreement and if adequate monitoring of effectiveness is being conducted. Forest Plan modeled outputs are not consistent with the changes enacted by the Northwest Forest Plan; however, this was predicted and no immediate change is recommended.

## **MONITORING ITEM: *ANADROMOUS AND RESIDENT FISH HABITAT***

**GOALS(S), MONITORING QUESTIONS(S):** The Forest goal is to provide and maintain habitats with diversity and quality, capable of recovering populations of resident and anadromous salmonid fish species to the potential of site productivity. Monitoring questions are:

- Are the quantity and quality of rearing pools and coarse woody material being generated in the stream channel for fish habitats to address objectives of site potential?
- Are Forest Plan goals, objectives, and desired conditions for anadromous and resident salmonid fish being achieved? Are management activities consistent with ACS objectives?
- How effective are fish habitat improvement projects on stream channel configurations?

### **FINDINGS AND EVALUATION:**

In fiscal year 2004, the Rogue River-Siskiyou National Forest developed a rating system to determine the highest priority watersheds for restoration using hydrology and fisheries data (*A Strategy for Fish Habitat Recovery - Rogue River and Siskiyou National Forests* – 2002 and Integrated Work Planning {IWP} – 2004). The latter process, IWP, uses criteria developed by Fisheries, Hydrology, Wildlife, Fuels and Forest Health. Fisheries and hydrology coordinated criteria for an overall aquatic rating for watersheds (5<sup>th</sup> field HUC) on the Forest in the IWP process.

Countervailing criteria were used for a combined fisheries and hydrology rating, firstly to rate the watersheds by the highest fisheries value (beneficial uses) and secondly by the resource problems within the watershed that required timely restorative actions. Countervailing criteria were used to balance the need to secure the watersheds with the most functioning salmon habitat (fisheries) with the need to address and perform restorative work in watersheds where streams were listed for water quality problems (hydrology).

The highest priority fisheries and hydrology watersheds on the Forest listed in rating order are:

- South Fork Coquille (Coquille River Sub-basin),
- Elk Creek (Upper Rogue River Sub-basin),
- Sucker Creek (Illinois River Sub-basin),
- Elk River (Sixes Sub-basin),
- East Fork Illinois River (Illinois River Sub-basin) and
- Applegate River-McKee Bridge (Applegate River Sub-basin).

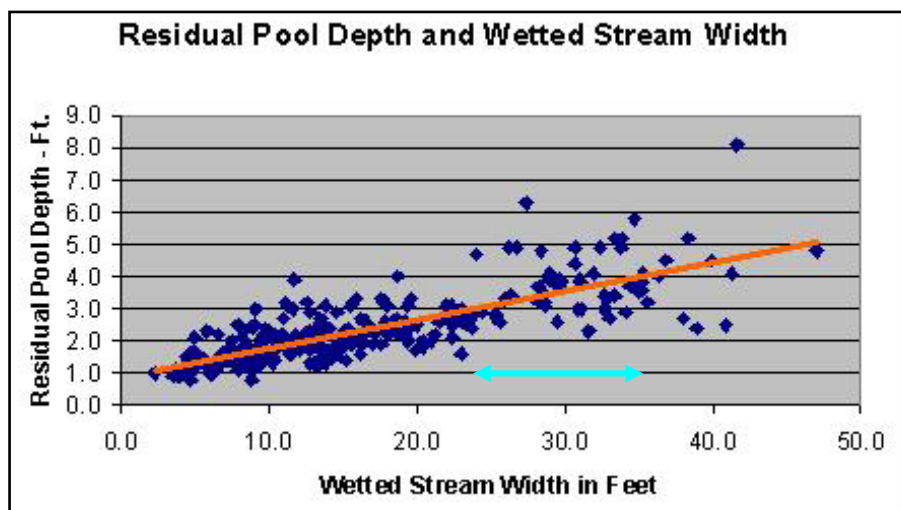
## Identifying Habitat Limiting Factors and Restoration Reaches with Stream Survey Data

The Forest has surveyed about 85% of the fish-bearing streams, concentrating on anadromous fish habitat. This constitutes about 1,250 miles of stream survey data from Forest streams and smaller rivers. The principal attributes collected that relate to **Forest Plan Monitoring Item: Anadromous Fish Habitat** cited above, are rearing pools for fish, and coarse woody materials in streams. These two attributes can be used to monitor the effectiveness of fish habitat improvement projects in stream channels by surveying pre- and post-project as listed above under **Goals**.

Using the Headwaters South Fork Coquille River as an example, the following explanation and maps depict how stream survey data is used to steer restoration work in the stream channel and arrive at future expected habitat conditions. This sub-watershed is 40,233 acres in size and has a surveyed average wetted width of approximately twenty-five to thirty-five feet in the reaches above the South Fork Coquille Falls. This watershed is located on the northern edge of the Klamath Mountain Province and is one of the few on the Forest within the Tyee Sandstone geology, more prevalent north of the South Fork Coquille and along the Oregon Coast. Precipitation and humidity are high here, more typical of near coast watersheds. Much of the sub-watershed was logged by railroad in the early 1900s and the second growth forest is in a large and not mature tree forest condition (Brown 1985) where re-growth has produced trees about 24 to 30 inches in diameter. The principal fish-bearing segments of the South Fork Coquille average a gradient of about one percent (1%).

Analyzing the data collected in the Klamath Mountain Province portion of the Rogue River-Siskiyou National Forest some expected conditions for pools and large wood were approximated. About 270 stream segments were summarized to determine 75<sup>th</sup> percentile conditions for pool depth and large wood in the channel. The 75<sup>th</sup> percentile is used when reference or pristine stream segments are not available to determine the range of conditions expected in a functioning stream system. Expected number of primary pools and large wood pieces per mile for a functioning stream of similar size are estimated from the top 25% (upper quartile) of all the stream segments surveyed on the Forest in watersheds of similar characteristics and size. Wetted width is used as a surrogate for stream size and/or watershed acres tributary to the reach.

**Figure 1. Scatter Plot of Pool Depths and Wetted Width for Klamath Mountain Streams Surveyed**



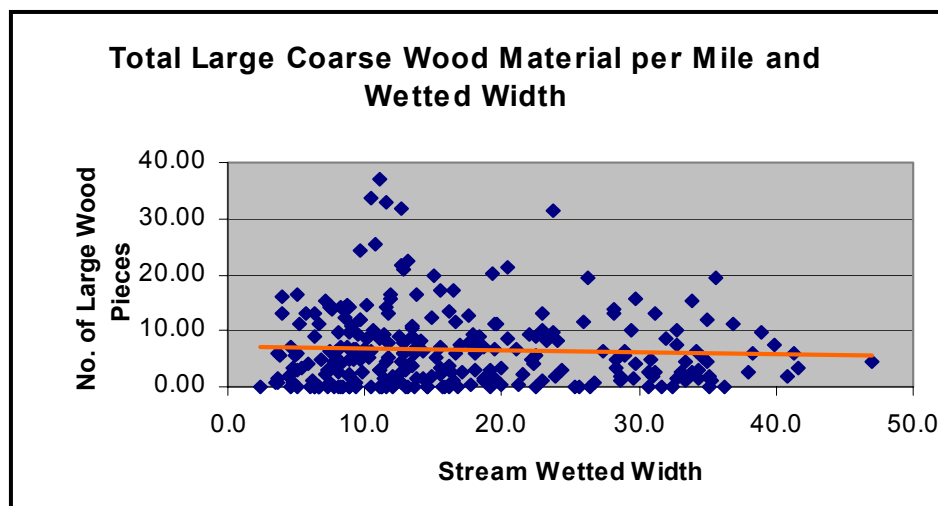
The blue arrow in Figure 1 depicts the width range of the stream segments surveyed in the Headwaters South Fork Coquille River sub-watershed within the main river channel. There is a strong relationship between the width of streams surveyed and the average pool depth. The 75<sup>th</sup> percentile value calculated for average residual pool depth for streams of this size is about 3.7 feet in depth. The 75<sup>th</sup> percentile for the number of pools deeper than three feet (3 feet) per mile is 12.3 pools per mile. Below is a table comparing actual values in the upper South Fork Coquille and the expected values for streams in the top quartile for pool depth.

**Table 2. Summary of Pools in the South Fork Coquille River in Headwaters Sub-watersheds**

Current Average Pool Depth	75 <sup>th</sup> Percentile for Similar Stream Size	Current No. of Pools > 3 ft./Mile	75 Percentile for Similar Stream Size
2.3 feet	3.7 feet	5.9	12.3

Coarse wood or large wood per mile can be similarly analyzed to approximate expected reference conditions. Here again, the 75% percentile or upper quartile is used for this approximation. The coastal areas of Southwest Oregon in this vicinity are capable of growing very large conifer trees. The streams used to derive values were surveyed in both coastal areas and areas within the Klamath Mountain Province with somewhat drier climates. The Klamath Mountains have highly varied geology and conifer growing site conditions, whereas the Tyee Sandstone is generally a more productive geology for conifer tree growth. The average and upper quartile estimates of number of pieces of large wood expected in streams of similar size as the South Fork Coquille River may be low because some stream segments are located in areas with much lower capability for conifer growth.

**Figure 2. Scatter Plot of Large Wood and Wetted Width for Klamath Mountain Streams**



Large wood is characterized as wood pieces that are minimally 24 inches in diameter at the small end of a piece at least 50 feet in length. Large wood pieces per mile, tends to decrease as stream width increases in the Klamath Mountain Province. The 75<sup>th</sup> percentile for similar size streams to the South Fork Coquille in the Headwaters sub-watershed is 9.5 pieces per mile of stream channel.

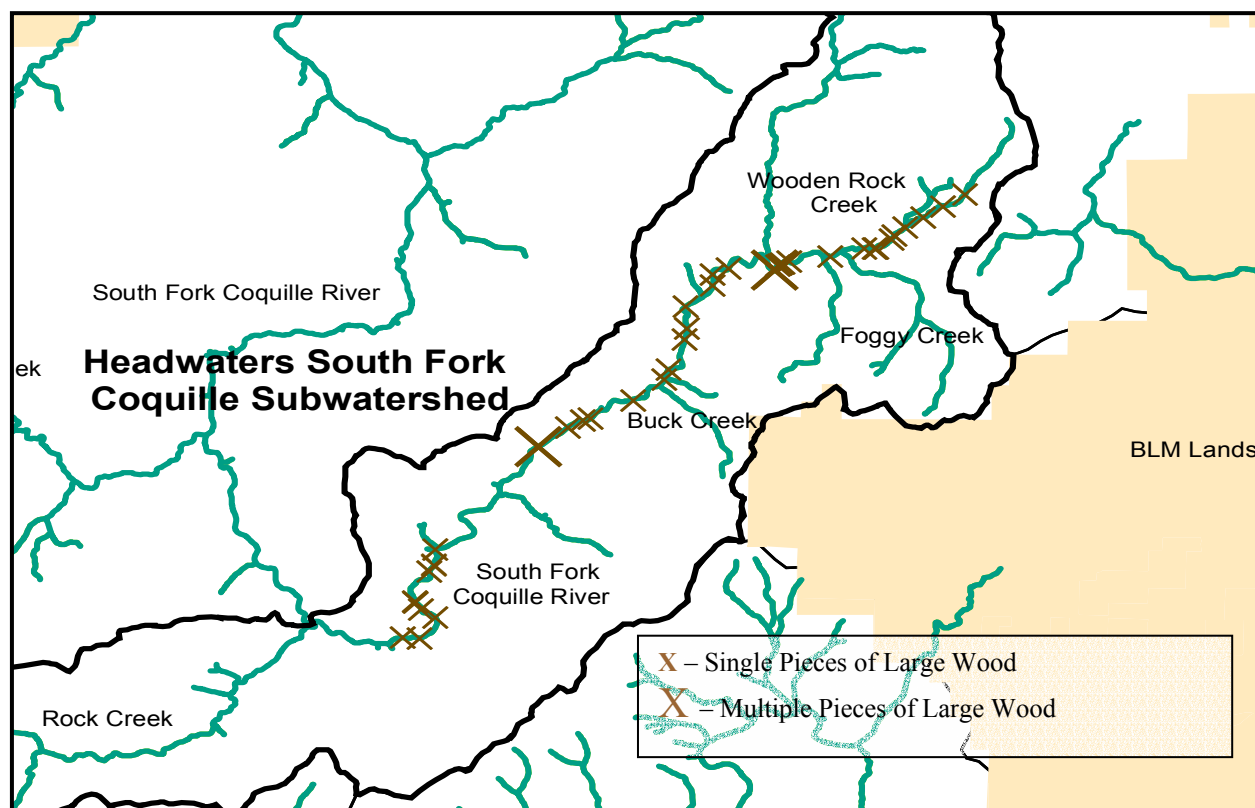


Large wood of this size collects much of the smaller size wood moving downstream during storm periods and is an important component of Western Oregon stream habitat conditions. An additional metric is shown in Table 3 comparing all wood pieces tallied in the stream survey as well as only the large wood pieces. The total wood category here includes all wood pieces greater than 12 inches in diameter and 25 feet in length. These smaller wood pieces are considered transitory in a coastal stream system as they rapidly move downstream during periods of high rainfall unless larger channel-spanning wood is present at stream bends or hydrologic nick points.

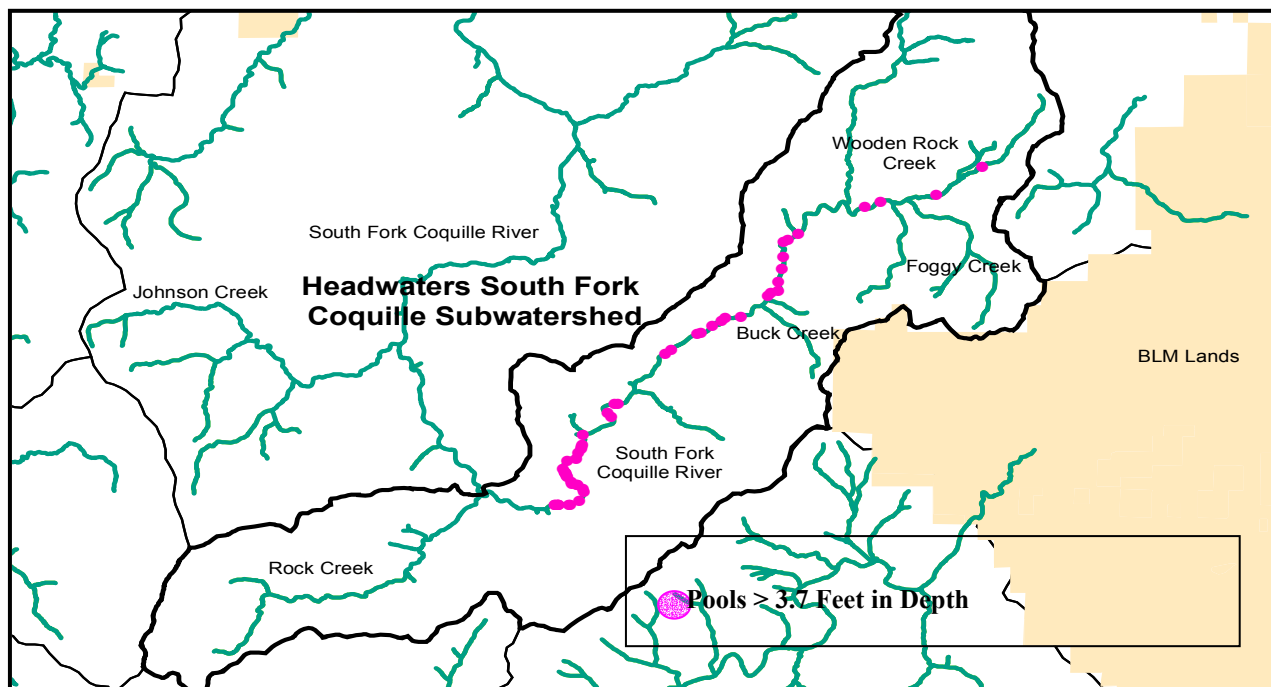
**Table 3. Summary of Coarse Wood Pieces per Mile in Headwaters Sub-watershed**

Current Large Wood per Mile	75 Percentile for Similar-Sized Streams	Current Total Wood per Mile	75 <sup>th</sup> Percentile for Similar-Sized Streams
6.7 Pieces	9.5 Pieces	28.9 Pieces	39.5 Pieces

**Figure 3. GIS Map of Large Wood Locations in South Fork Coquille Headwaters**  
(from Stream Survey Data)

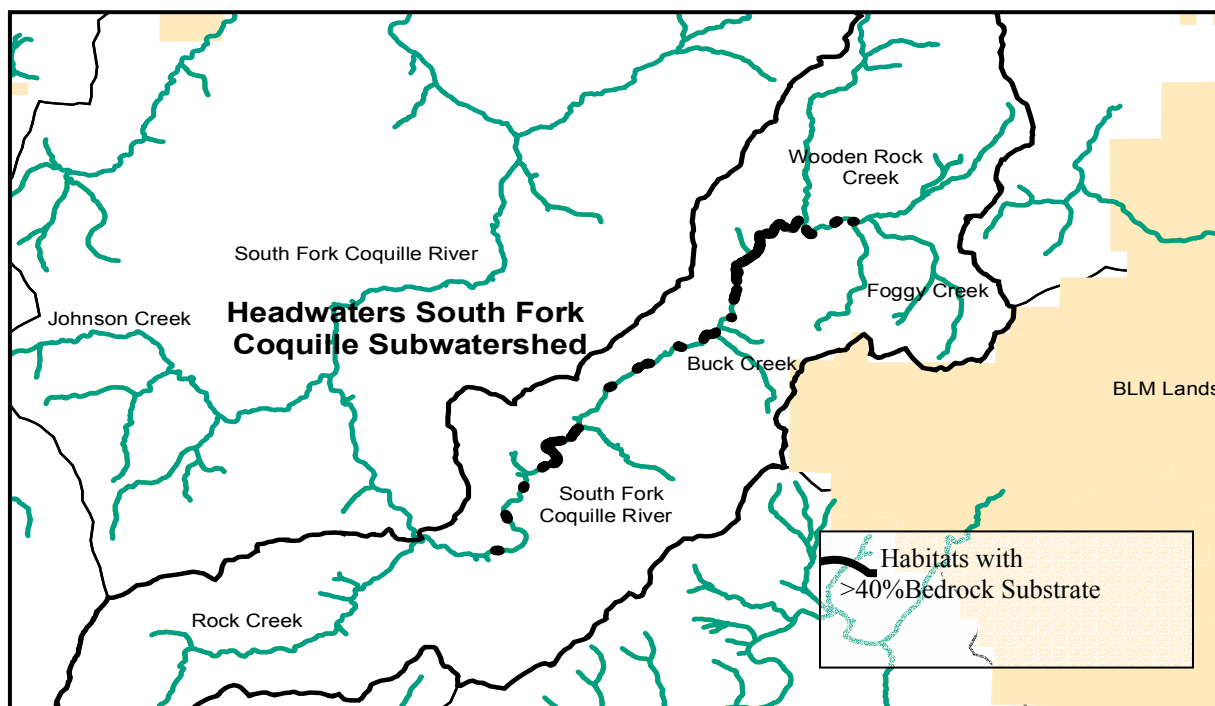


**Figure 4. GIS Map of Pools Greater Than 3.7 Feet Deep in South Fork Coquille**  
(from Stream Survey Data)



An additional attribute that relates to channel roughness (large wood and boulders can add roughness or variability to a homogenous stream channel) and pool formation is the presence of bedrock in the channel bottom. Stream surveyors note the amount of sand, gravel, cobbles, boulders and bedrock at each channel unit, for example pools and riffles. Figure 5 illustrates stream segments at the sub-reach scale where the stream bed has considerable contiguous bedrock on the stream bed. This type of substrate has little edge or crevice habitat for fish escape cover or for aquatic insect production. Addition of large wood or boulders generally slows water velocities during channel-changing storms and can cause deposition of sand, gravels and cobbles in these bedrock segments.

**Figure 5. GIS Map of Bedrock Areas in the Headwaters South Fork Coquille River**  
(from Stream Survey Data)



## Discussion

The headwaters of the South Fork Coquille is located about fifty miles from the Pacific Ocean and one would expect stream channel conditions in reference condition to be typical of functioning coastal streams: frequent deep pools, complexes and single pieces of large wood and considerable gravels for spawning and insect production. The above analysis technique is used for the five high priority watersheds in the Rogue River–Siskiyou National Forest to approximate the expected stream conditions if these streams were in a healthy and functioning condition. Frequency and location of pools and large wood meeting specific criteria can be calculated and mapped as shown from stream survey data and basic statistical analysis used to approximate reference conditions for some stream channel attributes. Limiting factors for fully functioning aquatic habitat conditions can be partially corrected using restoration techniques as the addition of large wood and/or boulders to stream channels. Long-term sustainability of functioning aquatic habitats will depend on riparian vegetation condition and the influential effects that road systems and other human disturbances have in the watershed.

Stream survey data collected for the past decade is useful to approximate reference conditions in streams of similar size and located within similar geologic zones. Several hundred miles of stream survey data was used in the above example to approximate the stream channel conditions expected in a functioning stream similar in size and character with the Headwaters of the South Fork Coquille River in SW Oregon. Stream survey data often comprises the only legacy data available when analyzing the condition of fish-bearing streams.

**RECOMMENDATIONS:** Results are acceptable. Continue to monitor.

## ***Resources and Service to People***

### **MONITORING ITEM: *CULTURAL (HERITAGE) PROPERTIES & SITES***

**GOAL(S), MONITORING QUESTION(S):** (1) to continue to meet federal laws and regulations, as well as programmatic agreements (MOA's) with other agencies and tribes, regarding heritage resource compliance for all appropriate projects; (2) to protect significant resources from damage and deterioration, or to undertake proper mitigation when resources are threatened; (3) to conduct relevant research, enhance the condition of resources, and interpret selected resources to the public.

The desired future conditions include: complete reconnaissance of entire Forest, with full inventory of "findable" heritage sites; all sites evaluated for their significance (some will require periodic reevaluation); all significant sites formally determined/nominated to the National Register, with long-term preservation/management plans in place; significant historic structures brought to best possible physical condition and given regular maintenance and needed rehabilitation; all appropriate resources are interpreted (on-site or by other methods) to the public; scientific research at selected sites continues to provide new and valuable information; all tribal "traditional cultural properties" are identified and managed as appropriate for the traditional values involved. The monitoring questions include:

- **Are sites being found by pre-project reconnaissance surveys, and are projects successfully avoiding/mitigating adverse effects to significant sites?**
- **Are significant sites being successfully protected from illegal excavation, vandalism, and natural decay? Is the public interpretation at sites providing the desired message and encouraging public appreciation of the resource?**
- **Is the Forest's Cultural Resource Inventory Strategy Plan (CRISP) doing an adequate job of predicting the kinds of locations where significant sites will be found?**

#### **FINDINGS, EVALUATION:**

In fiscal year 2004, cultural resource monitoring focused on field monitoring (done throughout the year on an as-convenient/efficient basis) of relatively "off-the-beaten track" cultural resource sites (i.e., visits to such places, to see if they looked "the same" as in years past, **or** if some sort of new damage --be it from humans or Mother Nature was occurring).

At least 30-35 such sites were visited; no signs of significant resource damage or other management concerns were observed. The effects of Mother Nature continue to take their toll on these sites, but no emergency situations were observed.

**RECOMMENDATIONS:** Results are acceptable. Continue to monitor.

## **MONITORING ITEM: *LAND SUITABILITY***

**GOAL(S), MONITORING QUESTION(S):** The goal is to manage for timber resources only on lands where technology exists to assure regeneration success within a specified time period. This Monitoring Item is required by 36 CFR 219.27(c)(1). The monitoring questions are:

- Are regeneration timber management activities confined to suitable lands?
- Are unsuitable lands properly classified? Has a change in technology affected suitability classification?

### **FINDINGS, EVALUATION & RECOMMENDATION(S):**

#### ***Rogue River National Forest***

All timber sale harvest areas are routinely assessed for suitability for regeneration harvest. These assessments usually encounter slightly more area of unsuitable lands than was recognized in the 1990 Forest Plan. Regeneration harvest is not prescribed on lands that have been verified as unsuitable. Some adjustments were made to the land base in the first few years of Forest Plan implementation.

There have not been any adjustments made to the land base in the last 5 years (2000-2004). Amount of such lands are felt to be insignificant at this time, but these changes are being tracked and will be incorporated into Forest Plan revision. There has been no change in technology that has or would affect land suitability classifications.

#### ***Siskiyou National Forest***

The 1989 Forest Plan has a threshold of 10,000 acres change in suitability classification for the first 10 years. Monitoring shows there are no changes beyond the threshold. The Northwest Forest Plan substantially reduced the land base for programmed timber harvest. It also adjusted the level of timber harvest for the Siskiyou National Forest (24 MMBF/year).

**RECOMMENDATIONS:** The overall finding is that results are acceptable, management direction is being achieved and current practices need to continue. There is a recommendation to incorporate the summation of land suitability changes during Forest Plan revision.

## **MONITORING ITEM: *TIMBER OFFERED FOR SALE***

**GOAL(S), MONITORING QUESTION(S):** The goal is to manage for timber resources and long term harvest levels, as planned with the Forest Plan. This Monitoring Item is required by 36 CFR 219.12(k)(1). The Monitoring Question is:

- **Is the Forest offering the volume of chargeable and non-chargeable timber, as assumed in the Allowable Sale Quantity (ASQ) and the Timber Sale Program Quantity (TSPQ)?**

### **FINDINGS, EVALUATION & RECOMMENDATION(S):**

#### ***Rogue River National Forest***

Under the 1990 Land and Resource Management Plan, the TSPQ was 123.0 million board feet (MMBF) or 22.81 million cubic feet (MMCF) per year. Various factors associated with old-growth and late-successional habitat, court injunctions, lawsuits and new land management decisions (i.e., the Northwest Forest Plan) changed the amount of timber offered for sale. Under the Northwest Forest Plan, 26 MMBF has been determined to be the Probable Sale Quantity (PSQ) for the Rogue River portion of the Rogue River-Siskiyou National Forest. The following table shows the timber offered for sale and harvested since 1990.

**Table 4. Timber Volume Offered for Sale and Harvested: Rogue River National Forest**

Fiscal Year	Volume Offered (MMBF)	Volume Harvested (MMBF)
1990	197.1	134.3
1991	52.4	95.4
1992	7.3	62.8
1993	10.5	61.2
1994	14.7	47.0
1995	26.3	28.8
1996	22.2	20.4
1997	25.1	30.5
1998	19.7	19.1

Fiscal Year	Volume Offered (MMBF)	Volume Harvested (MMBF)
1999	2.6	11.1
2000	0.6	10.6
2001	0.8	2.5
2002	6.4	14.0
2003	8.9	8.9
2004	0.3	8.0
<b>Total</b>	<b>394.9</b>	<b>554.6</b>
<b>Average</b>	<b>26.3</b>	<b>37.0</b>

A sub-component of timber sale monitoring for the Rogue River National Forest is disclosure of information regarding roadway blowdown harvested under a programmatic decision made on July 28, 2000. Under terms of an appeal disposition agreement, the Forest is to report information about the locations where trees were removed, the volume sold, from what land allocations, the presence of Survey and Manage and/or Threatened or Endangered species, and the implementation of management recommendations and/or mitigation measures.

In FY 2004, no projects were implemented on the Rogue River National Forest under the Roadway Blowdown programmatic document. The Life of this document expired in July of 2004; therefore, reporting on this activity will cease after this report.

## *Siskiyou National Forest*

Under the 1989 Land and Resource Management Plan, the TSPQ was 160 million board feet (MMBF) or 28.4 million cubic feet (MMCF) per year. Various factors associated with old-growth and late-successional habitat, court injunctions, lawsuits and new land management decisions (i.e., the Northwest Forest Plan) changed the amount of timber offered for sale. Under the Northwest Forest Plan, 24 MMBF has been determined to be the Probable Sale Quantity (PSQ) for the Siskiyou National Forest. The following table shows the timber offered for sale since 1990, in MMBF.

**Table 5. Timber Volume Offered for Sale: Siskiyou National Forest**

Fiscal Year	Volume Offered (MMBF)	Volume Harvested (MMBF)
1990	137	120.0
1991	58	63.0
1992	2	50.0
1993	3	11.0
1994	8	12.0
1995	16	17.0
1996	28	56.0
1997	28	37.0
1998	24	20.0

Fiscal Year	Volume Offered (MMBF)	Volume Harvested (MMBF)
1999	18	26.0
2000	1	13.0
2001	1.5	3.1
2002	14.3	1.3
2003	9.7	6.9
2004	72.2	18.9
<b>Total</b>	<b>420.7</b>	<b>455.2</b>
<b>Average</b>	<b>28.0</b>	<b>30.3</b>

Fiscal Year 2004 volume totals included a substantial salvage volume from the Biscuit Fire Recovery Project.

### **Part Two: Specially Funded Inventory and Monitoring Projects for FY 2004 and FY 2005**

In fiscal year 2004 (as was the case in fiscal years 2001 through 2003), some additional funding specifically earmarked for monitoring and reporting was available. The Forest Staff Group decided to fund special projects above the specific elements associated with the respective monitoring strategies. The following includes a report of observations and findings from these inventory and monitoring efforts on the Rogue River-Siskiyou National Forest. These reports cover a period from October 2003, through mid summer of 2005.

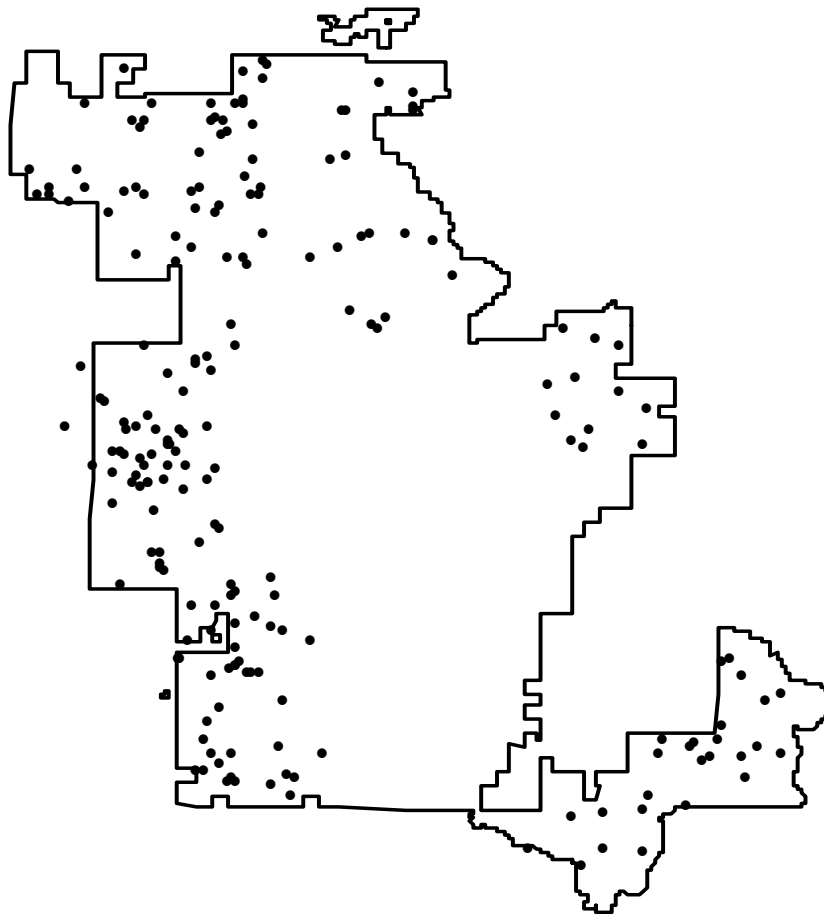
## ***Rock Quarry Inventory - Siskiyou National Forest***

Thanks to our partnership with the Geological Society of America - **GeoCorps America**, every quarry on the Siskiyou portion of the Rogue River-Siskiyou National Forest has been visited and information updated in both a physical and electronic file accessible to Forest employees. The quarry inventory began in summer 2001 and was completed summer 2005. Information collected included:

- Quarry status and current photos
- Rock quality and quantity
- Resource concerns
- Rehabilitation and/or waste area plan

Using an Access Database developed by the Westside GIS coordinator, GPS coordinates and other pertinent quarry data were entered by GeoCorps America interns. The database is tied to the GIS cover and accessible to engineering and planning personnel. To access the user-friendly GeoPoint database (and receive permission and instructions from the user-friendly GIS Coordinator), log on to:

<http://fsweb.fll.r6.fs.fed.us/nr/helpfiles/GeoPoint/index.shtml>



Each quarry on the Siskiyou National Forest has a physical file of information that is stored in the Engineering Zones. Development plans and drawings, information on location, status, rock type, quality and quantity are located in the files. Large paper maps at each Zone have quarry locations indicated with pins or colored dots.

Watershed planning and Roads Analyses now require this information to be more easily accessible with quarry sites accurately located and stored in GIS.

This inventory is necessary to supply current information to Roads Analyses and project planning, ensure road access to active quarries, identify resource concerns and quarry

rehabilitation prospects, identify and track potential quarry prospects and waste area sites, and track quarry use for forest and regional upward reporting.



**GeoCorps America** is an internship program for geologists sponsored by the Geological Society of America to raise awareness and increase the presence of geoscientists on public lands. Funding comes from individual and corporate support to GSA which is matched by the receiving agency. Agencies benefit from the interns knowledge, enthusiasm and hard work. During the summer of 2005, two interns based in Gold Beach OR experienced a diversity of work environments, including rock quarry inventory, Biscuit Wildfire soil erosion data collection and analysis, developing brochures on geologic points of interest on the Forest, and working as drivers during Blossom Wildland Fire suppression. For more information contact Margaret McHugh, or John Hawkins, Gold Beach Ranger District.



**2005 Intern, Gabriel Fuson**



**Stackyards Quarry**

## ***Soil Erosion After the Biscuit Fire - Siskiyou National Forest***

On July 13, 2002 the Biscuit Fire was started by a series of lightning strikes within the Kalmiopsis Wilderness in southern Oregon. These small individual fires quickly grew into one of the largest wildland fires in Oregon's history. In the end, the Biscuit Fire had burned nearly 500,000 acres of the Siskiyou National Forest. The burned area consisted of a mosaic of fire severities that burned indiscriminately through multiple vegetation and soil types.

After the fire began the long process of understanding impacts on natural resources. In order to understand the effects of fire on surface erosion, a series of soil erosion monitoring plots were installed after the fire and before the first winter storms in an effort to quantify effects on the soils. **The objectives for this monitoring include:**

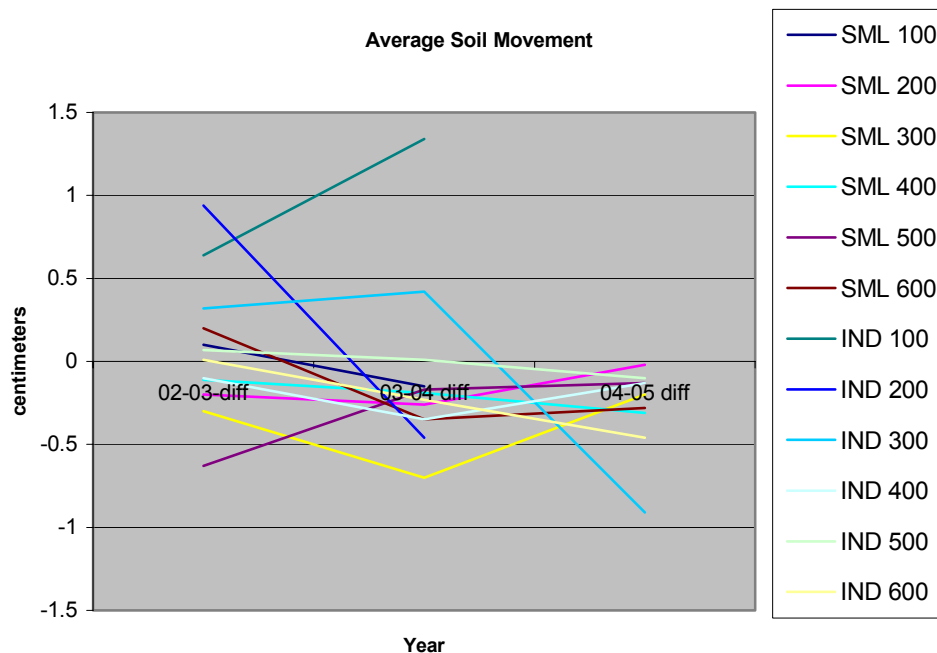
- Document the effects of fire on surface erosion in areas of high and low burn severity
- Acquire field data for calibrating current soil erosion models
- Quantify erosion potential to better mitigate soil loss during future management activities
- Establish long-term monitoring of the fire area after management and restoration

Before the first winter storms, 240 monitoring plots were installed on both the east and west sides of the Forest in the burned area. Plots were laid out in sets of 20 on NW facing slopes with % slope constrained to a range of 15% within each set. All plots are located in “unmanaged” areas of the forest (see example photo). Remaining vegetation, leaf litter, needle cast, and % surface rock were recorded. Each plot consisted of a 1m by 3m area marked off with wooden stakes at the corners, two pieces of rebar at the upslope end holding a log with earth bermed behind it, and two rebar pins at the bottom of the plot painted red. The height of the two pins at the bottom was measured immediately after installation, using a tape measure and Plexiglas square (for averaging the ground surface around the pins), to the nearest 0.1 cm.



**Based on this monitoring, the following observations are offered:**

- Some of the plots showed a net loss (erosion), while others showed a net accumulation of soil.
- Needle cast and leaf litter appear to have the greatest affect on erosion vs. accumulation, probably by dispersing energy from rain drops (IND 200, 300 were noted to have no post-fire needle cast)
- % slope appears to have a greater affect on erosion rates within similar burn severities. Slopes were generally steeper on the eastside (SML) plots.
- After three winter seasons, there does not appear to be a significant increase in soil movement due to the fire.



## ***Aerial Mulching Effectiveness After the Biscuit Fire Siskiyou National Forest***

This report addresses the implementation of aerial mulching and its effectiveness in preventing surface erosion. A concern after the 2002 Biscuit Fire was the potential for extensive soil erosion from heavy winter rains. The primary focus was on those areas burned with high fire severity that had been intensively managed in the past (clear-cut) leaving little to no remaining vegetation to disperse the energy of the coming rains. The BAER (burned area emergency rehabilitation) Team recommended aerial mulching of these slopes in order to mitigate possible soil erosion.

Aerial mulching consisted of 1,000-pound bales of chopped straw loaded into a net and aurally dispersed by helicopter. Monitoring directly after application showed that implementation was effective in providing uniform spatial distribution, and that mulch was effective in slowing rates of soil movement for the first two winter seasons. Soil movement increased sharply the third year.

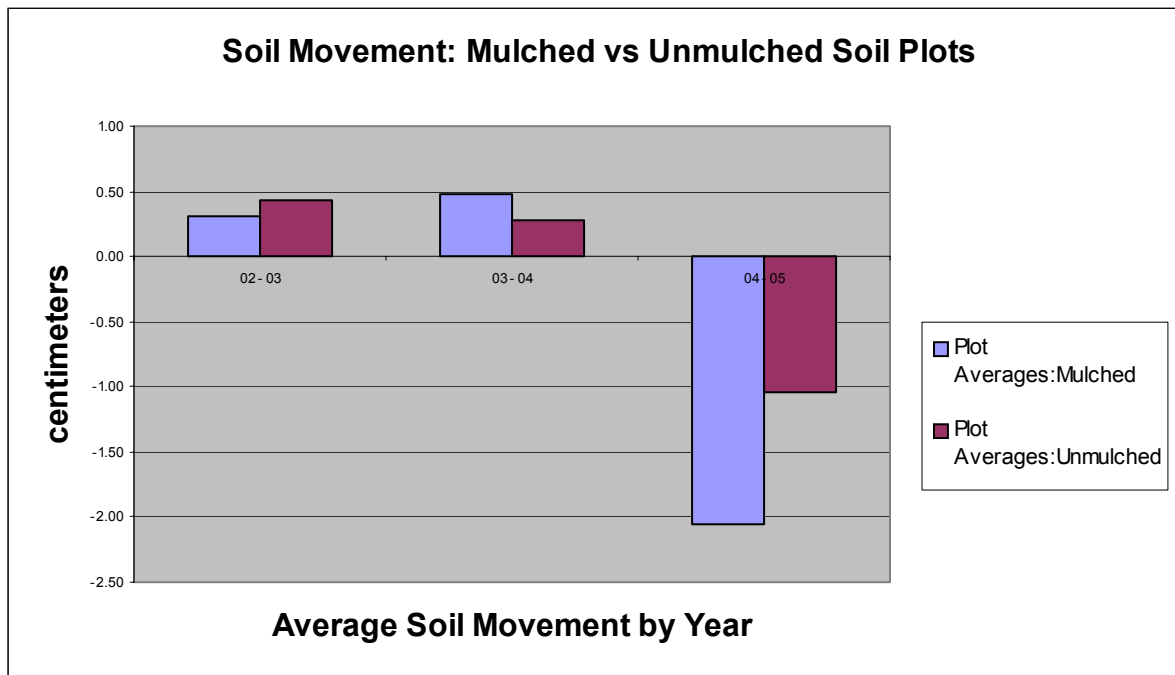
### **Why was this monitoring done?**

- Monitor implementation of the application process, and the effectiveness of the technique, i.e., how uniform was the cover?
- Document the effectiveness of aerial mulching in preventing surface erosion
- Monitor sprouting of native plants vs. sprouting mulch

Soil plots measure soil movement, not erosion—soil leaving the profile. Some extrapolation can be made from positive readings (soil accumulation) and negative readings (erosion), but this method was not installed to measure other than the movement of soil past the erosion pins.

### **Based on this monitoring, the following observations are offered:**

- Revegetation was rapid in all plots. Little visual difference in revegetation rates could be seen between mulched and un-mulched plots, but vegetation types were noticeably different. Native vegetation appeared to be suppressed by sprouting mulch, and bracken ferns were more common in mulched plots.
- Average rate of soil movement occurred as accumulation (positive readings) between 02 and 03, and between 03 and 04; erosion (negative readings) occurred between 2004 and 2005.
- Data collected from 240 additional plots in the fire area demonstrated on average, the majority of plots showed negative soil movement (erosion) between 2002 and 2004. Between 2004 and 2005, rates either stabilized or became positive (accumulation). The trend in the mulched plots was markedly different.



### What should we do in the future?

- Post-fire monitoring should include a vegetation grid and data collection on plant density, distribution, and type.
- Analyses should be done on all of the post-Biscuit plots to determine the relative importance of factors such as past management, climatic conditions, slope, aspect, soil texture and infiltration rates. The SW OR Ecology Group will monitor the plots in 2006.

### ***Endangered Plant Monitoring - Arabis macdonaldiana*** ***Siskiyou National Forest***

*Arabis macdonaldiana* (Macdonalds's rockcress) is a Federally-listed Endangered plant species originally described from Mendocino County, California. It is also known from Del Norte County, California and Curry County, Oregon. The vast majority of occurrences are in Del Norte County, in the N. Fork Smith River drainage. Habitat is rocky barren serpentine.



8 of 10 reported locations for *Arabis macdonaldiana* on Siskiyou NF were visited to verify their identification and to see how they fared in the 2002 Biscuit Fire area (including areas with Biscuit Fire suppression activities). 3 additional sites on Biscuit Fire areas in the adjacent Six Rivers NF (California lands) were visited. Monitoring occurred in April through May 2004, by Wayne Rolle, Cecile Shohet, and Linda Vorobik (contractor).

*Arabis aculeolata*, a closely related SW Oregon serpentine endemic, was also visited during the field reconnaissance, to see how it fared in the fire. The two taxa are very similar morphologically and phenologically, and occupy similar habitat. Conclusions about fire effects on *Arabis macdonaldiana* were made based on subjective observations of burned occurrences of both species.

### **Findings:**

- Four of the previously reported occurrences in Josephine County turned out to be *Arabis aculeolata*, not *Arabis macdonaldiana*.
- One occurrence on the California portion of Siskiyou NF (outside the Biscuit Fire area) turned out to be intermediate between the two species (species divisions are not strong in this group of purple-flowered rockcress).
- 1 new Siskiyou NF Oregon occurrence of *Arabis macdonaldiana* was found.
- 1 previously reported occurrence in Curry County could not be re-located (this one is outside the Biscuit fire area).
- There was not enough fuel to carry the fire through many of the occurrences. Where burned, the rockcress was usually absent.

### **Conclusions:**

- No Oregon occurrences of Macdonald's rockcress were lost in the Biscuit fire or during suppression activities. Some individuals were lost.
- In Oregon, *Arabis macdonaldiana* seems to be restricted to FS lands in Curry County.
- "Evasion" is perhaps the best term for the long-term strategy these two rockcresses have developed to deal with wildfire. Fire appears to kill these two rockcresses if they burn. But their habitat often has so little fuel that it escapes the burn. The rockcress probably capitalizes on newly available substrate to reproduce from seed, when wildfire burns close to, but not over, the adult plants.



## ***Sensitive Plant Monitoring - *Cypripedium fasciculatum**** ***Applegate Ranger District - Rogue River National Forest***

*Cypripedium fasciculatum* (CYFA) is a Region 6 Sensitive species and was a Survey and Manage species in the Northwest Forest Plan. It is a long-lived perennial that inhabits forested areas. It appears to have mycorrhizal associations which assist its life-cycle and we are just starting to learn about its pollinators. In 1999, the Cooperative Forest Ecosystem Research (CFER) of Oregon State University and partners began monitoring 31 populations of *Cypripedium fasciculatum* in southwestern Oregon.



New small *Cypripedium fasciculatum* plant

Three of these plots are on National Forest managed lands (one on the Rogue River National Forest (RRNF) and the rest are on Bureau of Land Management (BLM) lands. Fifteen of these plots were monitored to track phenology and make observations of pollinators. Work funded by Forest Service funds allowed continuation of the monitoring on the RRNF. BLM has taken over monitoring of their sites.

In 1999, individual stems of *Cypripedium fasciculatum* in the French Gulch area were marked with a pin in the ground and a label attached to the pin. Because multiple stems may arise from one plant's roots, it can be unclear whether stems near each other are one or more plants, so the reference to stems does not mean individual plants. Visits to the site were made weekly from the middle of March when stems started to emerge from the ground, until early June when fruiting stalks appeared to stop elongating. An additional visit was made in July to determine when fruits began to disperse seeds. All flowering stems were tracked as well as those that had flowered in previous years.

In 1999, 39 stems were tagged. In 2000 an additional 8 stems were tagged (total of 47 locations) but only 37 stems were seen at the 47 locations. In 2001, an additional 3 stems were located and tagged (total of 50 locations) but only 36 stems appeared in the 50 locations. Of the 36 stems that appeared, 11 produced flowers, 2 produced undeveloped buds, and 23 did not produce any reproductive structures. The year 2001 was a very dry year, reported to be the driest in 100 years. Although plants came up and dispersed seed at times similar to moister years, plants dried up quicker towards the end of the growing season than had been seen previously. In 2002, an additional stem was tagged for a total of 51 locations. Of the possible 51 locations, only 28 stems appeared and none of these produced flowers. It's presumed that the very dry year the year before left the plants without enough resources to allow flowers to be produced. It was also thought at the time that perhaps the population is decreasing in vigor and might be on its way out.

In 2003, 29 stems appeared within the 51 locations. Flowers were produced on 6 of these stems with two stems producing viable fruit (one with one capsule and the other with two capsules) and 8 produced undeveloped buds. Of these 29 stems, 4 were totally browsed by June 27.

In 2004, two new plants were observed and 29 stems appeared within the 53 locations. Flowers were produced on 7 of these stems with two stems supporting aborted buds. Two plants were totally browsed by April 27. After tracking this population for 7 years it can be seen that plants can skip a year or two or even three without producing a stem and still have a stem come up after that. Once a plant starts to bloom doesn't assure that it will bloom each year. Plants were seen to alternate flowering and non-flowering each year or produce flowers for several years, not flower a year, and then produce flowers the next. For further information, contact Barbara Mumblo, District Botanist.

### ***Sensitive Plant Monitoring - *Cimicifuga elata**** ***Applegate Ranger District - Rogue River National Forest***

A Conservation Strategy for *Cimicifuga elata*, a Region 6 Sensitive plant species, was completed in 1996 for lands under federal management in Oregon. Agencies included in this strategy are four National Forests (Rogue River, Umpqua, Mt. Hood, and Willamette), four Bureau of Land Management Districts (Eugene, Medford, Roseburg, and Salem) and The United States Army Corps of Engineers (Willamette Valley Project). Monitoring was included as a key component of the Conservation Strategy. One of the types of monitoring included is for population health monitoring, to track trends of the populations. Three populations are found on the Rogue River National Forest and all are considered "selected" populations where monitoring is to be conducted to track trends of the populations.



One population, Mule Creek, was informally monitored in 1996. Two of the populations (Woodpecker and Glade Creek) were informally monitored in 1996 and 1998, noting number of plants and whether each had produced flowers. In 1999, plants in these two populations were individually tagged to better track the plants. In 2000, these two populations were again monitored, measuring each plant, noting insect damage and/or browse, and whether the plants had flowered and set seed. In 2001, it was planned to monitor the Mule Creek population but due to work priorities this was not accomplished. In August, 2001, the Quartz Fire was ignited by lightning and burned through the Woodpecker and Glade Creek populations. These two sites were revisited to assess fire damage to these plants.

The Woodpecker Springs site is a small population located along a perennial stream. In 1996, it had 9 plants, 6 flowering and 3 non-flowering smaller plants. In early 1997, a major flood occurred, impacting the sides of the stream. The population was not monitored again until 1998, when only 6 plants (2 flowering and four non-flowering) were located. Four of the original sites were missing and three "new" sites were located.

Because some plants were not being re-located and some plants were located for the first time, it was decided to tag individual plants in 1999 to better track individuals. In 1999, ten plants were located including three at two new sites. In 2000, all ten plants were re-located. Except for a loss of some plants after the flood, the small population appears to be regaining numbers and appearing stable. After the Quartz Fire in 2001, the site was again surveyed. Of the 10 plant sites tagged, 5 were missing plants (4 of which were burned over), 2 had non-flowering plants, and 3 had flowering plants. The fire came very near all of the sites generally burning within 10 feet or less of every site. In 2002, 15 plants were seen, none were flowering. Four new sites with 7 plants had been located.

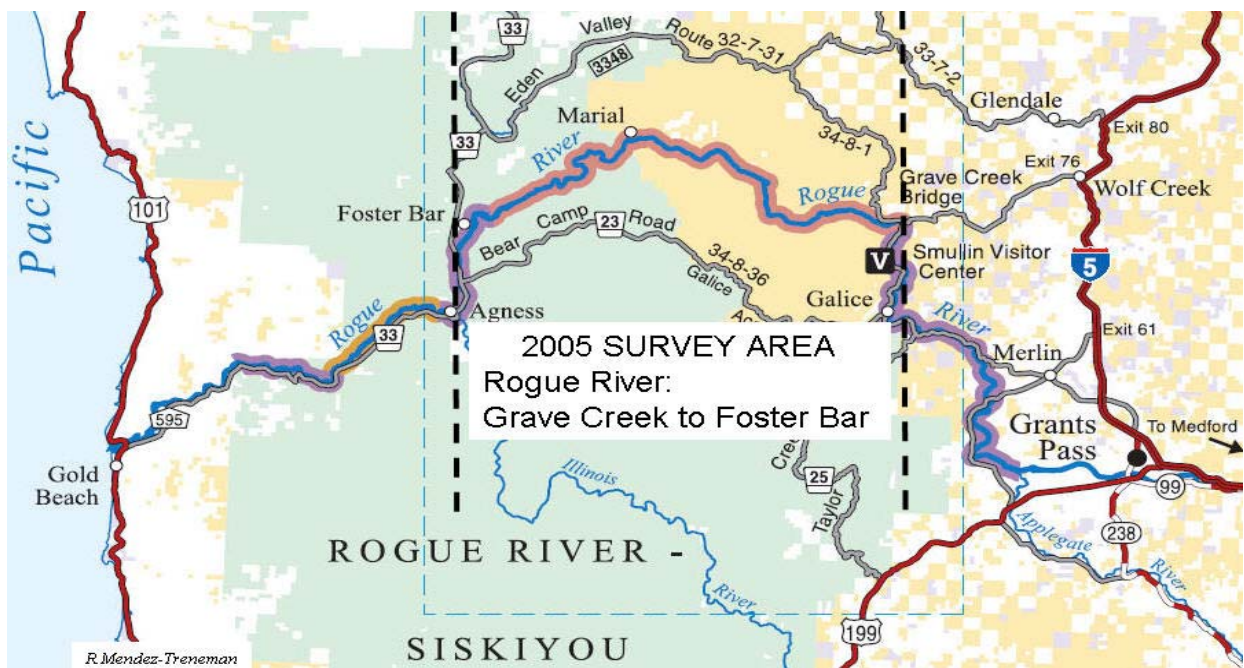
In 2004, 8 plants were located, all had flowered. One of the new sites from the last visit was missed during the survey. In 1996, the Glade Creek site had 42 plants, 22 flowering and 20 non-flowering. After the 1997 flood there were 41 plants, 35 flowering and 6 non-flowering. In 1999, there were 43 plants, 33 flowering and 10 non-flowering. In 2000, there were 46 plants, 29 flowering and 17 non-flowering. These plants were often browsed heavily so not all flowers produced seed. There were some plants that seeded heavily though. The flood did not appear to have affected this population as much as the Woodpecker population.

The Glade Creek population appears to be stable at this time. After the Quartz Fire, the site was again surveyed. Of the 48 sites tagged for previously discovered plants, 24 were missing plants (the fire burned through 17 of these), 2 had non-flowering plants, and 20 had flowering plants most of which appeared to have seeded. In 2003, 8 new plants were located for a total of 55 plant locations. Of these 55 locations, 45 plants were located, 35 flowering/fruited and 10 non-flowering/fruited. Ten plants were still missing from being burned by the fire. Since these populations are both in riparian areas with running water in the streams, the moistness of the site even in a severe drought may have allowed the fire to burn with mixed severity through them. Even though portions were burned very hot and some plants were consumed, other areas still retained vegetation and duff where plants survived unaffected by the heat or were only scorched. Some plants were able to come back from roots under ground if they weren't burned too severely. In 2004, 46 plants out of 53 plant locations were seen. Of these 46, 41 had flowered and fruited and 5 were vegetative. One large clump of about 20 plants had about half the plants heavily browsed. Even though there is some loss of individuals in the Glade Creek site it appears to be rebounding with new plants appearing in other parts of the population. The smaller population at Woodpecker Springs has always been a little tenuous because of so few individuals. For further information, contact Barbara Mumblo, District Botanist.

### ***Western Pond Turtles of the Lower Rogue River Gold Beach Ranger District - Siskiyou National Forest***

The Lower Rogue River was monitored for the presence, distribution, and structure of the western pond turtle (*Emys marmorata*) (formerly *Clemmys marmorata*). Searches for turtle nest sites were also conducted. The western pond turtle (WPT) is a USDA Forest Service Sensitive species. The survey area includes USDI Bureau of Land Management Lands and National Forest System lands. The portion of the Rogue River surveyed is 35.5 miles long and extends between Grave Creek at its upstream eastern limit and Foster Bar at the western downstream end (see Figure).





**Western pond turtle survey area; Lower Rouge River**

Surveys were conducted July 11-14, 2005. The lower 10.7 miles of the river (Blossom Bar Rapids to Foster Bar) were surveyed on July 11<sup>th</sup>. The remaining 24.8 miles of river (Grave Creek to Foster Bar) were surveyed July 12<sup>th</sup> - July 14<sup>th</sup>. A total of 106 WPT were observed (see Table). The WPT sightings were in proportion to the length of the river surveyed. Survey area "1" constitutes 30% of the survey area and 35% of the sightings occurred within it.

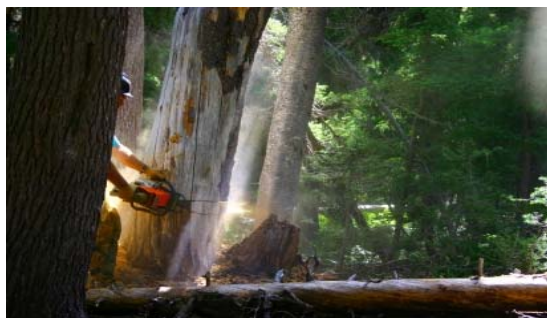
To estimate population structure, a total of 59 WPT were captured and evaluated. Captured turtles were each assessed for general condition, measured, sexed, palpated, weighed, marked with a unique code, and photographed. Fifty-five percent (55%) of the captured WPT were male and 45% female. Seventy-six percent (76%) of the captured WPT were adults and 24% were juveniles. The photo depicts WPT #69, a juvenile female originally captured in July 2003 then recaptured in July 2005. WPT #69 had a 63% (50 grams) weight gain (from 80g in 2003 to 130g in 2005) since its first capture. Recapture data allows for documentation of actual WPT growth rates within the study area. Such growth rates can be used as an indicator of ecosystem health.



Forty-two (71%) of the captured WPT had not been captured before and 17 (29%) were recaptures. Analysis of the recapture data indicates a high level of site tenacity. The greatest distance between a capture and recapture location was approximately 350 feet, yet some recaptures occurred three years after the initial capture. This suggests that WPT within this study area of the Rogue River have great affinity to one location of the river, even though they leave the river in the fall to over-winter in upland habitats. There are now 176 individually marked WPT in the Rogue River between Grave Creek and Shasta Costa Creek. For more information, contact Rolando R. Mendez-Treneman, District Wildlife Biologist

### ***Sky Lakes Wilderness Hazard Tree Reduction Rogue River National Forest***

As of August 2005, the first implementation stage of the Horse Camp Hazard Tree Reduction Project for the Sky Lakes Wilderness was completed. Pre-identified, hazardous snags within the Sky Lakes Wilderness were felled within Blue Canyon and within Seven Lakes Basin areas. Approximately 80% of all the identified Horse Camp hazard trees have been felled and temporarily naturalized (see table and photos below).



Pictures show Forest Service employees Jeff VonKienast falling hazardous snags at Grass Lake Horse Camp, and Jim Goode bucking snag. Tents in picture show example of accidents avoided by completion of project. Oregonian newspaper reporter and cameraman, hiking the PCT, heard a chainsaw and came in to investigate. See Stories at:

<http://www.oregonlive.com/weblogs/pacifictail/http>





The second implementation stage will consist of falling the remaining 20% of the Horse Camp hazard trees from Island Lake (Camp 3), Meadow Lake, Pear Lake, Alta Lake (1,2), & Honeymoon Cabin. Additionally, permanent means of naturalization may be utilized, if deemed appropriate, by blasting boles and stumps. Approximately 92 stumps and 120 boles may require blasting treatment, contingent upon Cultural Resource input. Efforts to plan, schedule, and budget Stage 2 will commence in FY 2006.

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